

RECEIVED
CENTRAL FAX CENTER

SEP 10 2004

Office Action Response
August 5, 2004 (amended as of September 9, 2004)
Ser. No. 09/834,389
Page 4

Amendments To the Claims:

1. (canceled)

2. (currently amended)

A fuel cell comprising:

- a. a single flexible or ridged bipolar separator plate;
- b. a flexible membrane electrode assembly;
- c. a flexible seal, adhesive or gasket interposed between said single flexible or ridged separator plate and said flexible membrane electrode assembly, wherein said flexible seal, adhesive or gasket between said flexible or ridged separator plate and said flexible membrane electrode assembly comprises the fuel cell module, and wherein said flexible seal, adhesive or gasket is optionally an adhesive which encapsulates edge portions of said flexible or ridged separator plate and said flexible membrane electrode assembly and wherein said flexible seal, adhesive or gasket seals the edge portions of said flexible membrane assembly to prevent the release of reactants from the fuel cell, and where the edge portion of the flexible or ridged separator plate is ~~rolled~~ bent

Office Action Response
August 5, 2004 (amended as of September 9, 2004)
Ser. No. 09/834,389
Page 5

over, or crimped ~~over the edge of the said flexible membrane assembly so as to overlap a substantial portion of said flexible membrane electrode assembly~~ to prevent the release of reactants from the fuel cell

d. a manifold for the delivery and removal of reactants and reactant products to and from the fuel cell reactive areas where said manifolds may be either a single or multiple manifolds; and
e. bond interposed between said manifold and said flexible or ridged separator plate, wherein said bond affixes said manifold to said flexible or ridged separator plate and wherein said bond provides a seal between said manifold and said flexible or ridged separator plate to prevent the release of reactants from the fuel cell.

3. (previously presented) The fuel cell of claim 2 wherein said fuel cell is assembled as a single cell module which is assembled with additional single cell modules to create a fuel cell stack or unit.
4. (previously presented) The fuel cell of claim 2 wherein said fuel cell module in

Office Action Response
August 5, 2004 (amended as of September 9, 2004)
Ser. No. 09/834,389
Page 6

claim 2 comprises said single flexible or ridged bipolar separator plate, said membrane electrode assembly, said flexible adhesive bond, seal or gasket between said single flexible or ridged bipolar separator plate and said membrane electrode assembly, said manifold or manifolds, said adhesive bond or bonds interposed between said manifold or manifolds and said flexible or ridged bipolar separator plate.

5. (previously presented) The fuel cell of claim 2 wherein said separator plate comprises a metal material, a composite material, a polymeric plastic material, or combinations thereof.
6. (previously presented) The fuel cell of claim 2 above wherein the separator plate has a thickness between about 0.0001 inch and about 0.500 inch and area of between 0.1 inches square and 5000 inches square.
7. (previously presented) The fuel cell of claim 2 wherein the separator plate is of a square configuration, a rectangular configuration or other polygonal configuration, a circular configuration or any other rounded configuration.

Office Action Response
August 5, 2004 (amended as of September 9, 2004)
Ser. No. 09/834,389
Page 7

8. (previously presented) The fuel cell of claim 2 above wherein said adhesive, seal or gasket is applied to said separator plate or said adhesive, seal or gasket is applied to said membrane electrode assembly and said separator plate and said membrane electrode assembly are bonded and or sealed together as a single unit.
9. (previously presented) The fuel cell of claim 2 wherein said adhesive bond of support 2c is a gasket.
10. (previously presented) The fuel cell of claim 2 wherein the gasket comprises a plastic polymeric material, or an elastomeric material, a composite material, a metallic material, a foam material, or combinations thereof.
11. (previously presented) The fuel cell of claim 2 wherein said adhesive bond, seal or gasket forms part of the reactant flow field.
12. (previously presented) The fuel cell of claim 2 wherein said manifolds are external to the BSP and the MEA as to not cause disruption or through holing of the MEA either internal

Office Action Response
August 5, 2004 (amended as of September 9, 2004)
Ser. No. 09/834,389
Page 8

or external to the electrochemically active area.

13. (previously presented) The fuel cell of claim 2 wherein said manifolds are bonded to said BSP.
14. (previously presented) The fuel cell of claim 2 wherein said manifolds are comprised of a plastic material, or a composite material, or a metallic material.
15. (previously presented) The fuel cell of claim 2 wherein said manifold is a single manifold.
16. (previously presented) The fuel cell of claim 2 wherein said manifolds are multiple in nature up to 26 manifolds.
17. (previously presented) The fuel cell of claim 2 wherein said manifolds have passages for a single reactant or multiple reactants and or a coolant or multiple coolants.
18. (previously presented) The fuel cell of claim 2 wherein the bond between said manifold or manifolds and said membrane electrode assembly comprises a plastic material, a elastomeric

Office Action Response
August 5, 2004 (amended as of September 9, 2004)
Ser. No. 09/834,389
Page 9

material, a composite material, a metallic material, a foam material, or combinations thereof.

19. (canceled)

20. (currently amended) The fuel cell of claim 2 wherein the bent, ~~or~~ crimped ~~or~~ rolled edge is continuous or discontinuous around the periphery of the entire fuel cell.

21. (canceled)

22. (original) The fuel cell of claim 8 wherein the gasket comprises a plastic polymeric material, an elastomeric material, a composite material, a metal, a foam or combinations thereof.

23. (currently amended) A fuel cell module comprising:
a. a bipolar separator plate having a perimeter edge portion ("BSP");
b. a single flexible membrane electrode assembly ("MEA"), wherein the perimeter edge portion of the BSP is ~~rolled~~, bent over, or crimped ~~over the~~

Office Action Response
August 5, 2004 (amended as of September 9, 2004)
Ser. No. 09/834,389
Page 10

~~edge of the flexible membrane assembly so as to overlap a substantial portion of said flexible membrane electrode assembly,~~ thereby aiding in preventing the release of reactants and reactant products from the perimeter of the module.

c. a flexible bond, seal or gasket interposed between the BSP and MEA, wherein said flexible bond, seal or gasket seals the edge portions of the BSP and MEA to prevent the release of reactants from the edge of the fuel cell module;

d. a manifold that is external to the BSP and MEA for delivery of reactants to and removing reactant products from the fuel cell reactive areas; and

e. a bond between the manifold and the BSP to affix the manifold to the BSP and provide a seal between the manifold and the BSP to prevent the release of reactants from the fuel cell module.

24. (previously presented) The fuel cell module of claim 23 assembled with at least one other fuel cell module of claim 23 to create a fuel cell stack.

Office Action Response
August 5, 2004 (amended as of September 9, 2004)
Ser. No. 09/834,389
Page 11

25. (previously presented) The fuel cell module of claim 23 wherein the BSP comprises a metal material, a composite material, a polymeric plastic material, or combinations thereof.
26. (previously presented) The fuel cell of claim 23, wherein the BSP has a thickness between about 0.0001 inch and 0.500 inch and an area of between 0.1 inches square and 5000 inches square.
27. (previously presented) The fuel cell module of claim 23, wherein the BSP is of a square configuration, a rectangular configuration or other polygonal configuration, a circular configuration or any other rounded configuration.
28. (previously presented) The fuel cell module of claim 23, wherein the adhesive, seal or gasket is applied to the BSP or MEA to bond them together as a single unit.
29. (previously presented) The fuel cell module of claim 23, wherein the edge portions of the BSP and MEA are sealed with a gasket.
30. (previously presented) The fuel cell module of claim 29, wherein the gasket comprises a plastic polymeric material, an elastomeric

Office Action Response
August 5, 2004 (amended as of September 9, 2004)
Ser. No. 09/834,389
Page 12

material, a composite material, a metallic material, a foam material, or combinations thereof.

31. (previously presented) The fuel cell module of claim 23, wherein the adhesive bond, seal or gasket forms part of the reactant flow field.
32. (previously presented) The fuel cell module of claim 23, wherein the manifold is bonded to the BSP.
33. (previously presented) The fuel cell module of claim 23, wherein the manifold comprises a plastic material, a composite material, or a metallic material.
34. (previously presented) The fuel cell module of claim 23, wherein the manifold is a single manifold.
35. (previously presented) The fuel cell module of claim 23, wherein there is a plurality of manifolds.
36. (previously presented) The fuel cell module of claim 35, wherein said manifolds have passages for a single reactant or multiple reactants and/or a coolant or multiple coolants.

Office Action Response *September 9, 2004*
August 5, 2004 (amended as of ~~August 27, 2004~~)
Ser. No. 09/834,389
Page 13

37. (currently amended) The fuel cell module of claim 36, wherein the bent, or crimped ~~or rolled~~ edge is continuous or discontinuous around the periphery of the entire fuel cell module.

Conclusion

For the reasons stated above, the present application is now ready for allowance.

Sept. 9, 2004
Dated: ~~August~~ 2004

By: *Daniel P. Maguire*
Daniel P. Maguire, Reg. 41,506
Tel: (530) 750-3661
Attorney for Franklin and Mettler

Sept. 9
Dated: ~~August~~ 2004

By: *Tom M. Moran*
Tom Moran, Reg. 26,314
Tel: (650) 843-5104
Attorney for Bawden and Arikara

SEP 10 2004

PTO/SB/21 (02-04)

Approved for use through 07/31/2006. OMB 0851-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

TRANSMITTAL FORM (to be used for all correspondence after initial filing)	Application Number	09/834,389	
	Filing Date	April 13, 2001	
	First Named Inventor	Jerrold E. Franklin	
	Art Unit	1745	
	Examiner Name	Gregg Cantelmo	
Total Number of Pages in This Submission	11	Attorney Docket Number	109.04

ENCLOSURES (Check all that apply)		
<input type="checkbox"/> Fee Transmittal Form <input type="checkbox"/> Fee Attached <input type="checkbox"/> Amendment/Reply <input type="checkbox"/> After Final <input type="checkbox"/> Affidavits/declaration(s) <input type="checkbox"/> Extension of Time Request <input type="checkbox"/> Express Abandonment Request <input type="checkbox"/> Information Disclosure Statement <input type="checkbox"/> Certified Copy of Priority Document(s) <input type="checkbox"/> Response to Missing Parts/Incomplete Application <input type="checkbox"/> Response to Missing Parts under 37 CFR 1.52 or 1.53	<input type="checkbox"/> Drawing(s) <input type="checkbox"/> Licensing-related Papers <input type="checkbox"/> Petition <input type="checkbox"/> Petition to Convert to a Provisional Application <input type="checkbox"/> Power of Attorney, Revocation <input type="checkbox"/> Change of Correspondence Address <input type="checkbox"/> Terminal Disclaimer <input type="checkbox"/> Request for Refund <input type="checkbox"/> CD, Number of CD(s) _____	<input type="checkbox"/> After Allowance communication to Technology Center (TC) <input type="checkbox"/> Appeal Communication to Board of Appeals and Interferences <input type="checkbox"/> Appeal Communication to TC (Appeal Notice, Brief, Reply Brief) <input type="checkbox"/> Proprietary Information <input type="checkbox"/> Status Letter <input checked="" type="checkbox"/> Other Enclosure(s) (please identify below): Substitute pages of Office Action response as required by Notice of Non-Compliant Amendment
Remarks		

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm or Individual name	Daniel P. Maguire
Signature	<i>Daniel P. Maguire</i>
Date	9 September 2004

CERTIFICATE OF TRANSMISSION/MAILING

I hereby certify that this correspondence is being facsimile transmitted to the USPTO or deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date shown below.			
Typed or printed name	Daniel P. Maguire		
Signature	<i>Daniel P. Maguire</i>	Date	10 September 2004

This collection of information is required by 37 CFR 1.5. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

703 372 9306
12:17 am (EST)